

# EXECUTIVE STOCK OPTIONS AND EARNINGS MANAGEMENT IN THE PORTUGUESE LISTED COMPANIES

OPCIONES SOBRE ACCIONES Y GESTIÓN DE RESULTADOS EN LAS EMPRESAS PORTUGUESAS COTIZADAS

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## ABSTRACT

Theoretically, executive stock options align managers' and shareholders' interests. However, previous studies have indicated that stock options may engender manager-shareholder conflicts (Jensen, 2005) and create incentives for earnings management (e.g. Jensen, Murphy and Wruck, 2004; Burns and Kedia, 2006; Efendi, Srivastava and Swanson, 2007). Therefore, this paper examines the implications of stock option grants on earnings management. In particular, we address the following question: Does stock options grant induce incentives for earnings management? Using a sample of 33 non-financial listed Portuguese firms-year from 2003 to 2010, we find that managers are more likely to engage in earnings management when they hold stock options. This study suggests that stock options may not always be effective in aligning the interests of managers and shareholders. Rather, executive stock options seem to affect the informational quality of earnings negatively, and consequently reduce the quality and value relevance of published financial data.

**KEYWORDS:** stock options, earnings management, discretionary accruals.

**JEL Classification:** M410, G32, G34

## RESUMEN

Teóricamente, las opciones sobre acciones para ejecutivos permiten alinear los intereses de la dirección con los de los accionistas. No obstante, los estudios anteriores han indicado que las opciones sobre acciones pueden provocar conflictos de intereses entre ejecutivos y accionistas (Jensen, 2005) y crear incentivos para la gestión de resultados (e.g. Jensen et al., 2004; Burns and Kedia, 2006; Efendi et. al., 2007). Así, este trabajo examina las implicaciones de la atribución de opciones sobre acciones en la gestión de resultados. En particular, planteamos la siguiente pregunta: ¿La atribución de opciones sobre acciones induce la práctica de gestión de resultados? Utilizando una muestra de 33 empresas portuguesas no financieras cotizadas para el período 2003-2010, observamos que los ejecutivos son más propensos a la adopción de

prácticas de gestión de resultados cuando poseen opciones sobre acciones. Consecuentemente, este estudio sugiere que las opciones sobre acciones no siempre eficaces para alinear los intereses de los ejecutivos con los de los propietarios de la compañía. De facto, las opciones sobre acciones parecen afectar negativamente la calidad de los resultados y, consecuentemente reducen la calidad y relevancia de los estados financieros publicados.

**PALABRAS CLAVE:** Opciones sobre acciones, Gestión de Resultados, Devengo Discrecionales.

**Clasificación JEL:** M410, G32, G34

## 1 | INTRODUCTION

Agency theory suggests that the monitoring mechanisms can improve the alignment of management and shareholders' interests and mitigate any opportunistic behaviour resulting from conflict of interests.

A mechanism that can potentially be used to minimize agency problems consists of integrating incentives in managers' remuneration packages. Aimed at aligning the interests of executives with those of the shareholders, stock options have become a popular component of managerial compensation packages. Stock options provide incentives for executives to take actions that increase share prices and consequently shareholders wealth. Theoretically, this would improve the alignment of management and shareholders' interests and therefore reduce agency costs, since stock options provide a direct link between executive utility level and shareholder wealth. Actually, aligning managers' interests with those of the shareholders is one of the most often cited reasons for seeking shareholders' approval for the executive stock option grant (see, e.g. EDP annual report 2003-2010; Brisa annual report 2003-2010).

However, previous empirical studies reveal that managerial equity compensation is positively related to the extent of earning manipulation (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006). In fact, while executive stock options align managers' interest with those of the shareholders, they may also have some dysfunctional effects (Hall and Murphy, 2002, 2003; Meulbroeck, 2001). In practice, stock options may produce manager-shareholder conflicts (Jensen, 2005) and induce executives to engage in earnings management (e.g. Jensen, Murphy and Wruck, 2004; Burns and Kedia, 2006; Efendi, Srivastava and Swanson, 2007). Really, managers may choose accounting methods in self-interested attempts to manage stock prices to maximize the value of stock options they hold (Fields, Thomas and Vincent, 2001). For example, Yermack (1997) hypothesises that managers influence their compensation contracts to include more option awards preceding the release of good news. Aboody and Kasznik (2000) investigate whether chief executive officers (CEOs) manage the timing of their voluntary disclosures around stock options awards. Their results suggest that CEOs make opportunistic voluntary disclosure decisions that maximize their stock option compensation.

As reported earnings may affect stock price movement, one way managers can influence the stock price of the firm is to manipulate reported earnings (Subramanyam, 1996; Zhang et al., 2008). Therefore, stock options compensation encourages earnings management. For example, Balsam, Chen and Sankaraguruswamy (2003) find that managers use earnings management to decrease the market price prior to stock option grants. Bartov and Mohanram (2004) find that managers inflate earnings, through accruals management, prior to large stock options

exercises. Cornett, Marcus and Tehranian (2008) document that stock options compensation encourages earnings management.

In this study, we examine the effect of stock options on a firm's earnings management activity. Using a sample of 33 Euronext Lisbon non-financial firms over a period of 8 years, from 2003 through 2010, we find evidence that managers are more likely to engage in earnings management when they hold stock options. As in Alves (2011) this study suggests that stock options may not always be effective in aligning the interests of CEOs and shareholders. Rather, they seem encourage CEOs engage in earnings manipulation.

The study makes some contributions to the existing literature. The study contributes to the earnings management literature: it investigates whether managers manipulate earnings when stock options are part of their compensation. This study also contributes to the management compensation literature: it evaluates stock options, a component of management compensation, as a potential incentive for earnings management. Therefore, this study contributes to the literature by showing the effect of executive stock options on earnings management. This is important because, there is limited knowledge on the implications of stock options compensation on managerial behaviour, especially in Portugal. Thus, this paper adds to the literature by being the first to provide empirical evidence on this issue in Portugal. In fact, although stock options have been used in a wide range of countries, mainly in the US and the UK, only recently have they become a component of managerial compensation in Portugal. The Portuguese market presents a unique case in the study of the determinants of executive stock options, because, it has a very different corporate governance structure, characterized by concentrated firm ownership and a strong bank presence. This feature can influence the earnings management activity. As the stock price rises, the stock options become more valuable to the managers. Higher earnings often imply higher stock returns. So, there is an incentive for managers to manipulate earnings and an information asymmetry problem is created by offering unreliable and irrelevant financial statements. This scenario creates agency costs and leads to opportunistic management behavior.

The findings of this study should be of interest to regulators and investors, which are concerned about earnings management and improving the quality of financial reporting. They also will be important to boards of directors contemplating compensation contracts for executives.

This paper is structured as follows. In section two, we provide an overview of the literature review and develop testable hypotheses. We present the variable measurement and describe the research methodology in section three. The sample selection process and characteristics of the sample are presented in section four. The results are reported and discussed in section five. We provide sensitivity tests in section six. Finally, section seven concludes the study.

## 2 | LITERATURE REVIEW AND TESTABLE HYPOTHESES

Stock options are one form of compensation which firms utilize to reward top management and align their interests with those of the firm. Actually, stock options provide incentives for executives to take actions that increase share prices and consequently shareholders wealth. However, those interests may not always be in line and even if they are, the executive may not always use appropriate means to improve firm performance. In fact, managers may act in their own interests in their response to the economic incentives in compensation contracts (Baiman, 1990). As the stock price rises, the stock options become more valuable to the managers. Higher earnings often imply higher stock returns. Therefore, stock options also give executives an incentive to manage earnings.

Considerable research has examined whether executive stock options help in aligning incentives. For example, Hanlon, Rajgopal and Shevlin (2003), using US data, examine the relation between stock options grants to the top five executives and the future earnings, and they find that a dollar of the value of an option grant is associated with future operating income over the next five years of approximately \$3.71. Conyon and Freeman (2002), using UK data, find a significant positive relationship between stock options and firm level productivity. For a sample of Japanese firms, Kato, Lemmon and Schallheim (2005) study the impact of stock options on firms' operating performance. They find that the post-grant operating performance of the adopting firms is significantly higher compared to firms that do not grant stock options. These studies suggest that stock options help in aligning incentives. In contrast, Kanagaretnam, Mathieu and Ramanan (2009), using US data, document a negative relationship between stock option and contemporaneous operating performance. Finally, Melle-Hernández (2005) and Alves (2011) also find a negative relationship between stock options and firm performance for a sample of Spanish firms and a sample of Portuguese firms, respectively.

Other studies have examined whether stock options induce opportunistic managerial behaviour. In the United States, for example, Baker, Collins and Reitenga (2003) and Balsam, Chen and Sankaraguruswamy (2003) find that firms make income-decreasing accruals prior to stock option grants. Cheng and Warfield (2005) document that managers with high equity incentives (stock ownership and stock options) are more likely to engage in earnings management and reporting earnings that meet or beat analysts' forecasts. Coles, Hertzel and Kalpathy (2006) examine earnings management around the cancellation and subsequent reissue of executive stock options. They find strong evidence of abnormally low accruals leading up to the option reissue date. Bergstresser and Philippon (2006) study the relation between earnings manipulation and CEO equity-based incentives. They find that the use of discretionary accruals to manipulate reported earnings is more pronounced at firms where the CEO's potential total compensation is more closely tied to the value of stock and option holdings. Zhang et al. (2008) examine the

effects of stock-based incentives on CEO earnings manipulation behaviours. With respect to the effect of stock options on earnings management, the results show that the larger the amount of out-of-the-money options, the more likely CEOs are to engage in earnings manipulation.

In Europe, Kuang (2008) using UK data, studies the effects of performance-vested stock options on the propensity of managers to engage in earnings management. Results suggest that greater performance-vested stock options holdings are associated with higher levels of abnormal accruals, which implies that managers are more active in managing earnings when they hold a greater part of their compensation in performance-vested stock options.

Summing up, recent studies suggest that stock options motivate executives to manipulate earnings. In this study we examine whether executives, when stock options are part of their compensation, manipulate earnings by using discretionary accruals. Therefore, our hypothesis, in alternative form, is:

*H1: Executive stock options are positively related to earnings management*

### 3 | VARIABLE MEASUREMENT AND RESEARCH DESIGN

#### 3.1. Measuring stock options

*Stock options* variable taking the value of 1 if the managers of firm *i* hold stock options for period *t*, and 0 otherwise. We use a binary variable, because for the period of analysis there is not information available allowing to measure the value of the stock options held by managers.

#### 3.2. Measuring earnings management

Following standard accounting literature, we use discretionary accruals as a proxy for earnings management. Discretionary accruals are estimated using both the cross sectional variation of the Jones model (1991) and the cross sectional variation of the modified Jones model proposed by Dechow, Sloan and Sweeney (1995), that are commonly used by most of earnings management research (Caneghem, 2002; Jaggi and Leung, 2007; Klein, 2002; Koh, 2003; Liu and Lu, 2007). Furthermore, recently some researchers have argued that current discretionary accruals are the most powerful models for estimating discretionary accruals among the existing models (Guay, Kothari and Watts, 1996; Ashbaugh, LaFond and Mayhew, 2003; Jaggi and Leung, 2007).

The Jones' model consists of regressing total accruals ( $TACC$ ) on two variables: the change in revenues ( $\Delta Rev$ ), which models the normal component of working capital accruals; and the level of gross property, plant and equipment ( $PPE$ ), included to control for the non-discretionary component of depreciation and amortisation expense, the main component of long-term accruals. Both variables and the intercept are divided by lagged total assets in order to avoid problems of heteroskedasticity. Non-discretionary accruals ( $NDACC\_Jones$ ) are the predictions from the ordinary least squares (OLS) estimation of model (1), while discretionary accruals ( $DACC\_Jones$ ) are the residuals.

The specific Jones model is as follows:

$$\frac{TACC_{it}}{TA_{it-1}} = \alpha_1 \left( \frac{1}{TA_{it-1}} \right) + \alpha_2 \left( \frac{\Delta Rev_{it}}{TA_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{TA_{it-1}} \right) + \varepsilon_{it} \quad [1]$$

Where,

$TACC$  = total accruals in year  $t$ , calculated as the difference between net income and operating cash flows.

$TA$  = total assets at the beginning of year  $t$ .

$Rev$  = change in revenues.

$PPE$  = gross property, plant and equipment.

$i, t$  = firm and year index.

The modified Jones model differs from the original Jones model in that the change in revenues is adjusted for the change in receivables ( $Rec$ ). Non-discretionary accruals ( $NDACC\_ModJones$ ) are the predictions from the OLS estimation of model (2), while discretionary accruals ( $DACC\_ModJones$ ) are the residuals.

The modified Jones model is as follows:

$$\frac{TACC_{it}}{TA_{it-1}} = \alpha_1 \left( \frac{1}{TA_{it-1}} \right) + \alpha_2 \left( \frac{\Delta Rev_{it} - \Delta Rec_{it}}{TA_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{TA_{it-1}} \right) + \varepsilon_{it} \quad [2]$$

Where,

$TACC$ ;  $TA$ ;  $Rev$ ;  $PPE$ ;  $i, t$  = as defined previously.

$Rec$  = change in accounts receivable.

### 3.3. Regression model and control variables

Given that the *stock options* are not the sole factors affecting earnings management, several control variables are introduced to isolate other contracting incentives that may be influence managers' accounting choices. Previous research suggests that board size, independent board, nonduality, board meetings, cash flows, leverage, net operating assets, performance, investment opportunities, firm size, ownership concentration and international financial reporting standards (IFRS) are associated with earnings management (e.g. Ali, Salleh and Hassan, 2008; Barton and Simko, 2002; Barth, Landsman and Lang, 2008; Chen, Cheng and Wang, 2010; Chung, Firth and Kim, 2002; Dechow, Sloan and Sweeney, 1995; DeFond and Jambalvo, 1994; DeFond and Park, 1997; Klein, 2002; Kothari, Leone and Wasley, 2005; Peasnell, Pope and Young, 2005; Xie, Davidson and DaDalt, 2003; Yang, Lai and Tan, 2008).

We evaluate the association between stock options and earnings management by estimating the following OLS regression:

$$DACC_{it} = + (Stock\ Options_{it}) + (Board\ Size_{it}) + (Independent\ Board_{it}) + (Nonduality_{it}) + (Meetings_{it}) + (Cash\ flows_{it}) + (Leverage_{it}) + (Net\ Operating\ Assets_{it}) + (Performance_{it}) + (Investment\ Opportunities_{it}) + (Firm\ Size_{it}) + (Firm\ Size^2_{it}) + (Concentration_{it}) + (IFRS_{it}) + \epsilon_{it} \quad [3]$$

Where:

$DACC_{it}$  = earnings management of firm i for period t by using two different proxies for earnings management: Jones model and the modified Jones model.

$Stock\ Options_{it}$  = dummy variable: 1 if the managers of firm i hold stock options for period t, and 0 otherwise.

$Board\ Size_{it}$  = number of members on the board of firm i for period t.

$Independent\ Board_{it}$  = ratio between the number of independent directors and the total number of board members of firm i for period t.

$Nonduality_{it}$  = dummy variable: 1 when firm's CEO and board chair is not the same person and 0 otherwise.

$Meetings_{it}$  = annual number of board meetings of firm i for period t.

$Cash\ flows_{it}$  = ratio between the operating cash flows and the total assets of firm i for period t-1.

$Leverage_{it}$  = ratio between the book value of all liabilities and the total assets of firm i for period t.

$Net\ Operating\ Assets_{it}$  = following Barton and Simko (2002) we use the beginning balance of net operating assets relative to sales. Net operating assets are measured as shareholders' equity less cash and marketable securities, plus total debt.

$Performance_{it}$  = as in Kothari, Leone and Wasly (2005) we measure performance as return on assets of firm i for period t.



*Investment Opportunities<sub>it</sub>* = ratio between the market value of equity and the book value of equity.

*Firm Size<sub>it</sub>* = logarithm of market value of equity of firm i for period t.

*Firm Size<sup>2</sup><sub>it</sub>* = squared of the logarithm of market value of equity of firm i for period t.

*Concentration<sub>it</sub>* = proportion of stocks owned by shareholders who own at least 2% of the common stock of firm i for period t.

*International Financial Reporting Standards (IFRS)<sub>it</sub>* = a dummy variable that take the value of one if a firm uses IFRS, and zero otherwise.

$\varepsilon_{it}$  = residual term of firm i for period t.

$\beta_0$  is a constant,  $\beta_1$  to  $\beta_{11}$  are the coefficients.

### *Control variables explained*

*Board Size.* The higher the number of members on the board; the greater the monitoring activity of management. If large boards enhance monitoring, they would be associated with less use of earnings management. In this vein, Chtourou, Bédard and Courteau (2001), Ebrahim (2007), Eisenberg, Sundgren and Wells (1998) and Xie, Davidson and DaDalt (2003) find that larger boards are associated with lower levels of discretionary accruals.

*Independent Board.* The higher the proportion of independent directors on the board; the greater the monitoring activity of management (Booth, Cornett and Tehranian, 2002). Therefore, earnings management would be less likely to occur in companies with boards having more independent directors. In this vein, Klein (2002), Xie, Davidson and DaDalt (2003), Peasnell, Pope and Young (2005; 2006), Ebrahim (2007) and Johari et al. (2008) find a negative relation between board independence and abnormal accruals.

*Nonduality.* Agency theory suggests that CEO duality (i.e. the CEO also serves as chairman of the board) increases agency problems, because duality promotes CEO entrenchment by reducing board independence (Jensen and Meckling, 1976; Finkelstein and D'Aveni, 1994; Rhoades, Rechner and Sundaramurthy, 2001). Since board independence can potentially be negatively influenced under the dual leadership structure, nonduality may limit earnings management. Therefore, agency theory predicts a negative relationship between nonduality and earnings management. Numerous studies support agency theory predictions (e.g. Dechow, Sloan and Sweeney, 1996; Davidson et al., 2004).

*Meetings.* Vafeas (1999) suggest that boards meeting frequency play an important resource in improving firm performance, and thus the effectiveness of a board. “A board that meets more often should be able to devote more time to issues such as earnings management” (Xie, Davidson and DaDalt, 2003, p. 300). Therefore, board meetings can help to improve the board effectiveness in monitoring financial reporting, and thus have a monitoring role in constraining

earnings management. Xie, Davidson and DaDalt (2003) find that when boards meet more often, discretionary accruals are lower.

*Cash Flow.* Cash flow may also be associated with discretionary accruals. Chen, Elder and Hsieh (2007), Dechow, Sloan and Sweeney (1995), Peasnell, Pope and Young (2000) and Yang, Lai and Tan (2008) find that firms with strong operating cash flows have lower levels of discretionary accruals.

*Leverage.* Empirical evidence suggests that managers of highly *leveraged* firms have strong incentives to use income increasing accruals to loosen the contractual debt-constraints (Ali, Salleh and Hassan, 2008; DeFond and Jiambalvo, 1994; Jiang, Lee and Anandarajan, 2008). However, high levered firms may be less able to practice earnings management because they are under close scrutiny of lenders. Chung, Firth and Kim (2002), Park and Shin (2004), Peasnell, Pope and Young (2000) and Yang, Lai and Tan (2008) find a negative relationship between leverage and earnings management.

*Net Operating Assets.* Because the balance sheet accumulates the effects of previous accounting choices, the level of net assets partly reflects the extent of previous earnings management (Barton and Simko, 2002). Therefore, Barton and Simko (2002) predict and find that managers' ability to optimistically bias earnings decreases with the extent to which net assets are already overstated.

*Performance.* Dechow, Sloan and Sweeney (1995) and Kothari, Leone and Wasley (2005) suggest that discretionary accruals are influenced by a firm's performance.

*Investment Opportunities.* Smith and Watts (1992) suggest that as the investment opportunities increase, the observability of managers' actions decreases. Therefore, managers of the firm with high investment opportunities are more difficult to monitor due to the high degree of information asymmetry between managers and shareholders (Gaver and Gaver, 1993, 1995; Smith and Watts, 1992). As a result, "*firm's investment opportunity set will affect managerial behavior and decision making*" (Chen et al., 2010, p. 195). AlNajjar and Belkaoui (2001), Park and Shin (2004) and Chen, Cheng and Wang (2010) find that firms with higher investment opportunities are more likely to engage in earnings management.

*Firm Size.* According to the size hypothesis large firms may have incentives to reduce political costs by reducing reported earnings (Koh, 2003). Banderlipe (2009), Jiang, Lee and Anandarajan (2008) and Peasnell, Pope and Young (2000) find that larger firms are associated with lower absolute discretionary accruals. Nevertheless, larger firms may have higher incentives to manage earnings, because they are subject to closer scrutiny by the investment banks and analyst community, leading them to adopt aggressive accounting policies (Chen, Elder and

Hsieh, 2007). Chen, Elder and Hsieh (2007), Chung, Firth and Kim (2002) and Yang, Lai and Tan (2008) find that larger firms are associated with higher absolute discretionary accruals.

*Firm Size*<sup>2</sup>. Sloan (1996) finds evidence of a concave relation between firm size and total accruals. Thus, we also include *Firm size*<sup>2</sup>, to examine whether a size effect the relationship between stock options and earnings management.

*Concentration*. As the ownership in Portuguese listed firms is highly concentrated, we also include the ownership concentration variable to control for the potential effect of ownership concentration on earnings management. In fact, large shareholders are expected to monitor managerial behaviour actions effectively, which reduce the scope of managerial opportunism to engage in earnings management (Dechow, Sloan and Sweeney, 1996). In this vein, Ali, Salleh and Hassan (2008) find that ownership concentration reduces the managers' discretionary behaviour.

*IFRS*. Since 2005, almost all publicly listed companies in Europe are required to prepare financial statements in accordance with IFRS (Regulation (EC) No. 1606/2002). This study sample covers the period from 2003 to 2010; hence, firms that reported in 2003 and 2004 are considered pre-IFRS firms, whereas firms that reported in 2005 to 2010 are considered post-IFRS firms. IFRS has had a large effect on company measurement and reporting methods (Ball, Kothari and Robin, 2000). The previous studies support the argument that the relation between earnings management and corporate governance can be affected by the introduction of IFRS (e.g. Barth, Landsman and Lang, 2008; Daske et al., 2008).

#### 4 | SAMPLE SELECTION AND CHARACTERISTICS

The initial sample includes all companies whose stocks are listed, in the main market, in Euronext Lisbon. A total of 50, 48, 51, 51, 51, 50, 49 and 52 companies were listed at the year end of 2003, 2004, 2005, 2006, 2007, 2008, 2009 and 2010 respectively (402 firm-year observations in total).

Foreign companies (30 in total) are excluded, because the differences in institutional environments. Companies not having shares listed in the previous year and companies whose shares were delisted in the following year are also excluded (66 in total). Companies (5 in total) with missing data are also excluded. Financial companies (37 in total) are excluded, too. As a result, the final sample size is 33 non-financial companies per year and, thus, 264 observations in total. This reduced number of observations may influence some results. Nevertheless, this limitation is an immediate consequence of the small size of the Portuguese stock market.

Information on stock options, board size, independent board, nonduality, annual number of board meetings, ownership concentration, operational cash flows, cash, marketable securities, liabilities, total assets, revenues, sales, gross property, plant and equipment, receivables and net income are collected from the Annual Report and Corporate Governance Report. Both Annual Report and Corporate Governance Report are available on-line at <www.cmvm.pt>. We obtain stock price data from the Euronext Lisbon, which allows measuring the variable firm size and investment opportunities.

Table 1 presents the sample descriptive statistics for the variables used in this research.

TABLE 1. SUMMARY OF DESCRIPTIVE STATISTICS  
(number of observations: 264; Period: 2003-2010)

	Mean	Median	Min.	Max.
DACC_Jones	-0.052	-0.056	-0.254	0.143
DACC_ModJones	-0.052	-0.056	-0.267	0.110
Stock options	0.170	0.000	0.000	1.000
Board size	8.219	7.000	3.000	23.000
Independent board	0.299	0.283	0.000	0.592
Nonduality	0.418	0.000	0.000	1.000
Meetings	20.700	14.000	4.000	58.000
Cash flows	0.071	0.077	-0.199	0.309
Leverage	4.406	1.985	0.167	20.214
Net operating assets	1.762	1.073	0.961	1.973
Performance	-0.012	0.018	-1.662	0.461
Investment opportunities	1.060	0.994	0.000	3.649
Firm Size	19.149	19.022	14.447	23.517
Concentration	0.695	0.735	0.163	0.735
IFRS	0.718	1.000	0.000	1.000

*DACC* represents discretionary accruals estimated from the original Jones (1991) and modified Jones (Dechow et al., 1995) models; *Stock options* dummy variable which takes a value 1 if the managers of firm *i* hold stock options for period *t*, and 0 otherwise; *Board size* is the number of members of the board; *Independent board* represents the ratio between the number of independent directors and the total number of board members; *Nonduality* dummy variable which takes a value 1 when firm's CEO and board chair is not the same person and 0 otherwise; *Meetings* represents the annual number of board meetings; *Cash flows* is the ratio between the operating cash flows and the total assets; *Leverage* represents the ratio between the book value of all liabilities and the total assets; *Net Operating Assets* represents the net operating assets relative to sales; *Performance* is the firm's performance; *Investment opportunities* represents the ratio between the market value of equity and the book value of equity; *Firm size* represents the firm's size; *Concentration* represents the proportion of stocks owned by shareholders who own at least 2% of the common stock; *IFRS* dummy variable which takes a value 1 if the firm uses IFRS, and 0 otherwise.

TABLE 2. PEARSON CORRELATION COEFFICIENTS MATRIX

	Board size	Independent board	Nonduality	Meetings	Cash flows	Leverage	Net operating assets	Performance	Investment opportunities	Firm size	Concentration
Board size	1										
Independent board	-0,053	1									
Nonduality	0,406***	0,135**	1								
Meetings	0,337***	0,134**	0,346***	1							
Cash flows	0,227**	0,096	0,303***	0,262***	1						
Leverage	-0,324**	0,033	0,066	0,022	-0,301**	1					
Net operating assets	0,065	0,087	0,009	0,189***	0,247**	-0,212**	1				
Performance	-0,052	0,013	-0,051	0,145**	0,043	-0,091	0,123**	1			
Investment opportunities	0,144**	-0,008	-0,009	0,135**	0,271***	-0,135	-0,087	-0,070	1		
Firm size	0,605***	0,179***	0,433***	0,442***	0,376***	-0,596**	0,266***	0,208***	0,003	1	
Concentration	-0,101	-0,077	0,107**	0,080	0,117	0,002	0,163**	0,084	-0,167**	-0,042	1

*Board size* is the number of members of the board; *Independent board* represents the ratio between the number of independent directors and the total number of board members; *Nonduality* dummy variable which takes a value 1 when firm's CEO and board chair is not the same person and 0 otherwise; *Meetings* represents the annual number of board meetings; *Cash flows* is the ratio between the operating cash flows and the total assets; *Leverage* represents the ratio between the book value of all liabilities and the total assets; *Net Operating Assets* represents the net operating assets relative to sales; *Performance* is the firm's performance; *Investment opportunities* represents the ratio between the market value of equity and the book value of equity; *Firm size* represents the firm's size; *Concentration* represents the proportion of stocks owned by shareholders who own at least 2% of the common stock.

\*\*\* Correlation is significant at the 0.01 level (2-tailed); \*\* Correlation is significant at the 0.05 level (2-tailed).

Table 1 shows that *DACC* variables have a mean and median value of -0.052 and -0.056 respectively. About 17% of companies attributed stock options during the period 2003 to 2010. *Board size* is comprised of approximately 8 members (with a median of 7 members). About 30% (with a median of 28.3%) of the board members are independent non-executive directors, with a minimum of 0.0% and a maximum of 59.2%. In about 41.8% of companies there is a separation of the functions of the CEO and chairman. On average, the board meets about 21 times a year. Cash flows variable represents on average 7.1 of the total assets of the company (with a median of 7.7). *Leverage* variable represents on average 4.406 of the total assets of the company (with a median of 1.985). The mean (median) level of *Net operating assets* is 1.762 (1.073). The mean and the median to *Performance* variable is -0.012 e 0.018, respectively, with a minimum of -1.662 and a maximum of 0.461. The descriptive statistics of the market-to-book ratio show that, on average, firms in our sample exhibit relatively high investment opportunities level with a mean (median) of 1.060 (0.994). The mean of firm size is about EUR 1.260 million with a minimum of EUR 1.881 thousand and a maximum of EUR 16.345 million. The *Concentration* variable shows that, on average, that listed companies in Euronext Lisbon display a large degree of ownership concentration. About 72% of the firms use IFRS.

The analysis of Table 2 shows that there are some significant correlations between the variables. The binaries variables (stock options and IFRS) are not included in the Table 2, given that the Pearson correlation coefficient is not computed to nominal variables. Some significant correlations between the variables are identified. For instance, there is a significant negative correlation between firm size and leverage, which suggests that larger firms have lower levels of leverage. There are also some significant positive correlation between firm size and board size, firm size and meeting, as well between firm size and noduality, suggesting that larger firms have a higher number of directors on the board, higher incidence of CEO nonduality and more board meetings. There is also a significant positive correlation between noduality and board size, suggesting that firms with separate chairman tend to have larger boards. Correlation coefficients are, in general, low suggesting the absence of serious statistical problems related with multicollinearity (Tabachnick and Fidell, 2001).

## 5 RESULTS AND DISCUSSION

Table 3 presents OLS regression estimates for the equation 3 developed in section three.

TABLE 3. OLS REGRESSIONS RESULTS  
(number of observations: 264; Period: 2003-2010)

Dependent variable	DACC_ Jones Model		DACC_ ModJones Model	
	Coef.	t test	Coef.	t test
Constant	1.303	5.305***	1.338	5.371***
Stock options	1.399	2.200**	1.404	2.212**
Board size	-0.401	-2.645**	-0.401	-2.651**
Independent board	0.015	1.136	0.018	1.143
Meetings	-0.565	-2.423**	-0.579	-2.450**
Nonduality	0.136	0.910	0.142	0.921
Cash flows	-0.047	-2.002**	-0.052	-2.010**
Leverage	0.004	2.187**	0.004	2.199**
Net operating assets	-0.395	-2.694**	-0.398	-2.798**
Performance	-0.006	-0.179	-0.006	-0.183
Investment opportunities	0.438	9.176***	0.448	9.199***
Firm Size	0.410	9.091***	0.420	9.165***
Firm Size <sup>2</sup>	0.038	2.091**	0.039	2.144**
Concentration	-0.029	-1.065	-0.031	-1.108
IFRS	-0.159	-0.990	-0.157	0.964
R-squared	37.37%		37.41%	
Adjusted R-squared	33.60%		33.65%	
F-statistic	9.914***		9.934***	

*DACC* represents discretionary accruals estimated from the original Jones (1991) and modified Jones (Dechow et al., 1995) models; *Stock options* dummy variable which takes a value 1 if the managers of firm *i* hold stock options for period *t*, and 0 otherwise; *Board size* is the number of members of the board; *Independent board* represents the ratio between the number of independent directors and the total number of board members; *Nonduality* dummy variable which takes a value 1 when firm's CEO and board chair is not the same person and 0 otherwise; *Meetings* represents the annual number of board meetings; *Cash flows* is the ratio between the operating cash flows and the total assets; *Leverage* represents the ratio between the book value of all liabilities and the total assets; *Net Operating Assets* represents the net operating assets relative to sales; *Performance* is the firm's performance; *Investment opportunities* represents the ratio between the market value of equity and the book value of equity; *Firm size* represents the firm's size; *Concentration* represents the proportion of stocks owned by shareholders who own at least 2% of the common stock; *IFRS* dummy variable which takes a value 1 if the firm uses IFRS, and 0 otherwise.

\*\*\* Significant at the 1-percent level; \*\* Significant at the 5-percent level; \* Significant at the 10-percent level.

Table 3 reports the results from equation (3) which examines the effects of stock options on CEO earnings management behaviours. Results suggest that stock options are significantly positively related to earnings management, suggesting that managers are more likely to engage in earnings management when they hold stock options. As a result, executive stock options appear to have a negative effect on the quality of reported earnings.

This result is consistent with some findings in the US (e.g. Baker, Collins and Reitenga, 2003; Balsam, Chen and Sankaraguruswamy, 2003; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Zhang et al., 2008) and UK (e.g. Kuang, 2008), who also report that stock options induce opportunistic managerial behaviour. Thus, like in countries characterized by dispersed ownership and well-developed capital markets, the use of stock options in Portugal seem also create incentive for managers to manipulate earnings. Consequently, an information asymmetry problem is created by offering unreliable and irrelevant financial statements.

Regarding the other variables, included as control variables, we find, in both models, as in Eisenberg, Sundgren and Wells (1998), Ebrahim (2007) and Xie, Davidson and DaDalt (2003), a negative relationship between *Board size* and earnings management, which suggesting that board size is effective in deterring managers' opportunistic earnings management. The *Meetings* is significantly negatively related to earnings management, which suggests that board meeting frequency play an important role in constraining earnings management, confirming the findings of Xie, Davidson and DaDalt (2003). As in Chen, Elder and Hsieh (2007), Dechow, Sloan and Sweeney (1995) and Yang, Lai and Tan (2008), we document, in both models, a negative relationship between the *Cash flow* and discretionary accruals. This result is consistent with the idea that *Cash flow* has a systematic inverse relationship with accruals (Peasnell, Pope and Young, 2000). *Leverage* is significantly positive, in both models, providing evidence that an increase in leverage encourage managers to use more accruals to manage earnings to avoid debt covenant violation, confirming the prediction and results of DeFond and Jiambalvo (1994) and Jiang, Lee and Anandarajan (2008). We find a negative relationship between *Net operating assets* and earnings management, suggesting that high level of net operating results are associated with lower levels of discretionary accruals, confirming the prediction and results of Barton and Simko (2002). Consistent with the findings of AlNajjar and Belkaoui (2001), Park and Shin (2004) and Chen, Cheng and Wang (2010), we also find, in both models, that firms with higher *investment opportunities* are more likely to engage in earnings management. Finally, as in Chen, Elder and Hsieh (2007), Chung, Firth and Kim (2002) and Yang, Lai and Tan (2008), we find that *large firms* have a higher level of earnings management, suggesting that larger firms are better able to manage accounting information and hide real performance. As in Sloan (1996), *Firm size*<sup>2</sup> is also statistically



positive. Thus, the observed impact of the stock options on earnings management is unlikely to be a size effect.

Results suggest no evidence that independent board, nonduality, performance, concentration and IFRS affect the levels of earnings management.

## 6 | SENSITIVITY ANALYSES

To ensure the robustness of our results, we perform several sensitivity checks. The first sensitivity analysis examines the effects of interaction between stock options and leverage on discretionary accruals. Both stock options and leverage are a part of the overall corporate governance structure of the firm; consequently, it is unlikely that they operate independently within the corporate structure. Consequently, it is likely that both monitoring mechanisms operate jointly to mitigate earnings management. The results in Table 4 show that stock options and leverage jointly reduce earnings management. The other results remain unchanged (at coefficient signal and significant level).

We treat stock options as a predetermined variable in the regression reported in Table 3, whereas it could be argued to be endogenous. In fact, the stock options are likely to be an endogeneous variable because both earnings management and stock options are managerial decisions based on firm characteristics. This raises the possibility that our single equation findings may be the result of specification bias. In supplementary tests, we employ a two-stage least squares procedure to endogenise stock options. The results obtained, in Table 5, using this simultaneous equation specification has implications on firm size variable, which the relationship with earnings management becomes negative. The other results remain unchanged (at coefficient signal and significant level).

The above analyses indicate that the results of this paper are robust after controlling the effect of interaction between stock options and leverage on discretionary accruals, as well the potential endogeneity problem.

TABLE 4. OLS REGRESSIONS RESULTS  
Number of observations: 264; Period: 2003-2010

Dependent variable	DACC_ Jones Model		DACC_ ModJones Model	
Independent variables	Coef.	t test	Coef.	t test
Constant	1.301	5.302***	1.335	5.369***
Stock options	1.389	2.199**	1.400	2.209**
Board size	-0.400	-2.641**	-0.399	-2.647**
Independent board	0.014	1.134	0.016	1.140
Meetings	-0.555	-2.421**	-0.571	-2.446**
Nonduality	0.134	0.908	0.140	0.920
Cash flows	-0.045	-2.001**	-0.051	-2.010**
Leverage	0.004	2.184**	0.004	2.193**
Net operating assets	-0.393	-2.691**	-0.397	-2.794**
Performance	-0.005	-0.177	-0.006	-0.181
Investment opportunities	0.431	9.166***	0.442	9.196***
Firm Size	0.408	9.088***	0.418	9.164***
Firm Size <sup>2</sup>	0.038	2.090**	0.036	2.141**
Concentration	-0.025	-1.062	-0.030	-1.105
IFRS	-0.157	-0.990	-0.158	0.966
Stock options*Leverage	-0.127	-5.655***	-0.130	-5.672***
R-squared	37.57%		37.61%	
Adjusted R-squared	33.70%		33.75%	
F-statistic	9.934***		9.944***	

*DACC* represents discretionary accruals estimated from the original Jones (1991) and modified Jones (Dechow et al., 1995) models; *Stock options* dummy variable which takes a value 1 if the managers of firm *i* hold stock options for period *t*, and 0 otherwise; *Board size* is the number of members of the board; *Independent board* represents the ratio between the number of independent directors and the total number of board members; *Nonduality* dummy variable which takes a value 1 when firm's CEO and board chair is not the same person and 0 otherwise; *Meetings* represents the annual number of board meetings; *Cash flows* is the ratio between the operating cash flows and the total assets; *Leverage* represents the ratio between the book value of all liabilities and the total assets; *Net Operating Assets* represents the net operating assets relative to sales; *Performance* is the firm's performance; *Investment opportunities* represents the ratio between the market value of equity and the book value of equity; *Firm size* represents the firm's size; *Concentration* represents the proportion of stocks owned by shareholders who own at least 2% of the common stock; *IFRS* dummy variable which takes a value 1 if the firm uses IFRS, and 0 otherwise; *Stock options\*Leverage* interaction between stock options and leverage.

\*\*\* Significant at the 1-percent level; \*\* Significant at the 5-percent level; \* Significant at the 10-percent level.

TABLE 5. 2SLS REGRESSIONS RESULTS  
 Number of observations: 264; Period: 2003-2010

Dependent variable	DACC_ Jones Model		DACC_ ModJones Model	
	Coef.	t test	Coef.	t test
Constant	1.785	3.742***	1.797	3.807***
Stock options <sub>-2SLS</sub>	1.259	2.091**	1.355	2.208**
Board size	-0.314	-2.386***	-0.354	-2.545**
Independent board	0.012	1.106	0.025	1.506
Meetings	-0.312	-2.485**	-0.400	-2.643**
Nonduality	0.145	0.935	0.155	0.986
Cash flows	-0.051	-2.009*	-0.065	-2.101**
Leverage	0.003	2.173*	0.006	2.249**
Net operating assets	-0.312	-2.485**	-0.385	-2.653**
Performance	-0.012	-0.336	-0.014	-0.479
Investment opportunities	0.429	8.166***	0.427	9.107***
Firm Size	-0.506	-2.398**	-0.598	-2.407**
Firm Size <sup>2</sup>	-0.192	-1.891*	-0.199	-1.909*
Concentration	-0.030	-1.065	-0.036	-1.084
IFRS	-0.109	-0.790	-0.112	-0.801
R-squared	36.10%		37.58%	
Adjusted R-squared	32.56%		32.97%	
F-statistic	10.217***		10.381***	

*DACC* represents discretionary accruals estimated from the original Jones (1991) and modified Jones (Dechow et al., 1995) models; *Stock options<sub>-2SLS</sub>* instrumental variable; *Board size* is the number of members of the board; *Independent board* represents the ratio between the number of independent directors and the total number of board members; *Nonduality* dummy variable which takes a value 1 when firm's CEO and board chair is not the same person and 0 otherwise; *Meetings* represents the annual number of board meetings; *Cash flows* is the ratio between the operating cash flows and the total assets; *Leverage* represents the ratio between the book value of all liabilities and the total assets; *Net Operating Assets* represents the net operating assets relative to sales; *Performance* is the firm's performance; *Investment opportunities* represents the ratio between the market value of equity and the book value of equity; *Firm size* represents the firm's size; *Concentration* represents the proportion of stocks owned by shareholders who own at least 2% of the common stock; *IFRS* dummy variable which takes a value 1 if the firm uses IFRS, and 0 otherwise.

\*\*\* Significant at the 1-percent level; \*\* Significant at the 5-percent level; \* Significant at the 10-percent level.

## 7 SUMMARY AND CONCLUSIONS

Theoretically, executive stock options align managers' and shareholders' interests.

However, previous studies have indicated that stock options may engender manager-shareholder conflicts (Jensen, 2005) and create incentives for earnings management (e.g. Jensen, Murphy and Wruck, 2004; Burns and Kedia, 2006; Efendi, Srivastava and Swanson, 2007).

Therefore, this paper examines whether stock options motivate managers to engage in earnings management, within the Portuguese capital market. Using a sample of 33 non-financial listed Portuguese firms-year from 2003 to 2010, we find that managers are more likely to engage in earnings management when they hold stock options. The empirical findings suggest that the earnings management practices of Portuguese listed firms are influenced by these firms' compensation structure. Specifically, our study shows that executive stock options increase the scope of managerial opportunism. Therefore, our findings indicate that executive stock options affect the informational quality of earnings negatively, and consequently reduce the quality and value relevance of published financial data.

Moreover, the results also reveal that there is less earnings management when board size, board meeting frequency, operating cash flows and net operating assets are high and that there is more earnings management when leverage, investment opportunities and firm size are high.

The findings of this study make the following contributions. First, the results indicate that, on average, executive stock options do not provide effective monitoring of earnings management in Portuguese listed firms. Second, this study suggests that it is important for Portuguese listed firms to design appropriate performance-contingent compensation plans that balance the advantages of incentives with the disadvantages of excessive self-serving inclinations. Third, the findings are relevant for countries with an institutional environment (mainly concentrated ownership) similar to that of Portugal. Finally, investors may also benefit from the findings because they provide insight into the impact of CEO compensation structure on earnings quality.

This study has, however, some limitations. First, the reduced number of observations may influence some results. Nevertheless, this limitation is an immediate consequence of the small size of the Portuguese stock market. Second, we compute discretionary accruals using both the Jones model (1991) and the modified Jones model (Dechow, Sloan and Sweeney, 1995). Although the models are accepted in accounting research, nevertheless, the accuracy of measurement of discretionary accruals will depend on how accurately the models can segregate discretionary accruals from total accruals. Third, the use of a binary variable to measure stock options, and thus its impact on earnings management, may also influence the

results. Actually, with this measure is not considered that the impact of the stock options on earnings management may depend on the value. Indeed, O'Connor et al. (2006) and Zhang et al. (2008) demonstrate that out-of-the-money and in-the-money options have different impacts on earnings management. Finally, the selection of the potential incentives can lead to the omission of some important incentives for earnings management. This mis-specification can generate biased and inconsistent estimates. Actually, other factors can influence the earnings management, such as ownership structure (Ali, Salleh and Hassan, 2008) and the managerial compensation structure (in addition to stock options) (Guidry, Leone and Rock, 1999; Healy, 1985; Holthausen, Larcker and Sloan, 1995).

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